Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

BENJAMIN LINCOLN ROBINSON Editor-in-Chief.

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Vol. 24. October, 1922. No. 286.

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Boston, Mass. 300 Massachusetts Ave.

Providence, R. I. Preston and Rounds Co.

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Address manuscripts and proofs to
B. L. ROBINSON, 3 Clement Circle, Cambridge, Mass.

Subscriptions, advertisements, and business communications to
W. P. RICH, 300 Massachusetts Avenue, Boston, Mass.

Entered at Boston, Mass., Post Office as Second Class Mail Matter.

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CAREX LAXIFLORA AND ITS RELATIVES.

K. M. Wiegand.

It is with much hesitation that the writer ventures a contribution to the literature of this perplexing group of sedges which has been a subject of special study at one time or another of nearly all our students of the Genus Carex. Work on the flora of Central New York has shown, however, that the group is not yet fully understood. To obtain a treatment for these local plants a general study has been undertaken and carried through at the Gray Herbarium. The herbaria of L. H. Bailey, the New York College of Agriculture, and the New England Botanical Club have also been consulted. In presenting the results in the following pages it is hoped that our understanding of this portion of the genus may be made clearer.

In the course of the study some new characters have been employed, and a few others, though generally used, have been omitted. By several recent writers certain species have been characterized as having "ancipital" or "flat" culms. However, during a long experience in the field, embracing all the northern species except *C. ormostachya*, the writer has never seen a plant of the "laxiflora" group with ancipital culms, but always with the culms triangular. The peduncles, to be sure, are sometimes flat, as long ago noted by Dewey (Wood's Class Book), but this is not constant for any species. The purple coloration in the basal sheaths has proved a good specific character in several species, but is difficult to use as these outer sheaths often weather off leaving only the inner which have a brown color. Very often however a small fragment of purple may be found caught among the shreds of the remaining sheaths. The color of

the foliage, and the type of roughness on the angles of the culm are often helpful characters. The length of the anther is useful in some cases, though highly variable within rather wide limits and differing greatly according to condition, that is to say whether fresh and full or dry. This length for the various species is as follows: *C. albursina* 1.4–2.0 (2.2) mm. dry or fresh; *C. blanda* 2.0–2.8 mm. dry, 3.0–3.5 mm. fresh; *C. laxiflora* 2.0–3.0 mm. dry, 3.0–3.5 mm. fresh; *C. ormostachya* 2.8–3.2 mm. dry; *C. crebriflora* 2.0–2.2 mm. dry; *C. ignota* 2.9–3.2 mm. dry; *C. anceps* 2.0–3.0 mm. dry, 3.2–4.0 mm. fresh; *C. striatula* 3.2–4.3 mm. dry; *C. styloflexa* 3.0–4.0 mm. dry; and *C. leptonervia* 1.3–2.3 mm. dry, 1.7–2.5 mm. fresh. The anthers at the very summit of the spike are usually much smaller than those farther down, and the measurements given do not apply to these. The length and plumpness of the perigynia may vary greatly, frequently without the variation being of taxonomic value. Often the filling out of the achene seems to broaden and shorten the perigynium. The term beak as here used signifies a point with concave sides in distinction from a merely acute apex. Many specific characters fluctuate greatly, and though generally true, occasionally fail, so that the species are best defined by the sum of all the characters. On the whole the nine species here admitted, though very closely related, are distinct. In two or three of the southern species there is an apparent tendency to produce stolons, but the specimens are few and imperfect. Much more field study is necessary to understand properly the southern forms. The writer wishes to take this opportunity to protest against the wretched labels so common in herbaria. In the case of several of the southern species treated in this paper, it has been impossible to determine whether they are plants of wet or dry soil, clay or sand, shady or exposed places, as not a single label bears so much as a suggestion of such facts. The localities, too, are for the most part imperfectly given.

The oldest specific name connected with the group is that of Lamarck, *C. laxiflora*. The application of the Lamarckian name has always been a matter of doubt. By the earlier authors the name was applied to narrow-leaved forms of what is here called *C. anceps* Muhl., but usually included also *C. leptonervia* and *C. striatula* Michx. Boott's *C. laxiflora* was more especially *C. striatula*. Bailey in his later papers,[1] after inspecting the specimens in Lamarck's herbarium,

[1] Mem. Torr. Bot. Club i. 32 (1889).

transferred the name to Boott's "var. *intermedia*" stating that Lamarck's specimens, from Virginia and New York, although young, were unmistakably the plant that Boott made var. *intermedia*. He further stated that these specimens had narrow leaves less than one-fourth inch in width, staminate spike conspicuous, pistillate narrow and very loosely flowered (½ to 1½ inches long), and very blunt perigynia. The really loose and alternately flowered forms, however, all have the perigynia apiculate or beaked, except sometimes *C. ormostachya*, which extends southward only to western Massachusetts. Lamarck may have had especially slender specimens of *C. blanda* or of the form called *C. laxiflora* in this paper, though the writer has seen none that would answer the descriptions of Lamarck and Bailey. *C. laxiflora* δ *intermedia* Boott, to which Bailey referred was a complex containing at least *C. ormostachya*, *C laxiflora*, and *C. leptonervia*. Of the plants in the Bailey herbarium labelled *C. laxiflora*, 13 are *C. laxiflora* as interpreted in this paper, 22 are *C. blanda* and several more are to be referred to other species. There is no means of determining how many of these specimens were in Bailey's hands when the above statements were written. The material distributed by Bailey as *C. laxiflora*, var. *intermedia* Boott (no. 159) is our *C. laxiflora*. Until the matter is settled by a reinspection of Lamarck's plants, the name *C. laxiflora* may continue to be applied to the form so named by Mackenzie (Britton & Brown's Ill. Flora ed. 2), and represented by Bailey's distributed specimen (of var. *intermedia* Boott).

C. anceps Muhl. (ex. Willd.) has been variously interpreted. Bailey, who saw the original specimen, treated it as a synonym of *C. laxiflora*, but the figure in Schkuhr's Riedgraeser and also Willdenow's description suggest the plant long called *C. laxiflora* var. *patulifolia*. The beak in Schkuhr's figure, especially, suggests this. The *C. striatula* Michx. also has been variously interpreted. Bailey, who saw the specimen on which this was founded, cites as synonyms (Mem. Torr. Bot. Cl. i. 32) *C. ignota* Dewey and *C. laxiflora* Boott t. 89; while in his herbarium labelled *C. laxiflora* var. *Michauxii* (i. e. *C. striatula* Michx.) are four specimens, two of which are *C. ignota* and two *C. styloflexa*, var. *remotiflora*. *C. laxiflora* Boott t. 89 is of course our *C. striatula*, but all the other citations and specimens of Bailey are not. For the plant called *C. striatula* in the present paper, Bailey proposed the name *C. laxiflora* var. *divaricata*, as

indicated by the type in his herbarium. The plant interpreted by the writer as *C. striatula* Michx. answers Michaux's description, and is the only one in the "Carolina" region cited which does. It also resembles a rather poor photograph of the type in the Bailey herbarium. This photograph was made many years ago, and is not clearly identifiable.

The types of the following species, all in European herbaria, should be re-examined: *C. laxiflora* Lam. Dict. de Bot. iii. 392 (1789), *C. heterosperma* Wahl. Köngl. Acad. Handl. xxiv. 151 (1803), *C. anceps* Muhl. in Willd. Sp. Pl. iv. 278 (1805), Schk. Riedgr. Nachtr. 66 f. 128 (1806), *C. nematostachya* Willd. in Schlecht. Linnaea x. 264 (1836), *C. striatula* Michx. Fl. Bor. Am. ii. 173 (1803), *C. truncata* Boeckl. Flora xli. 649 (1858), and *C. bulbosa* Boeckl. Flora xxxviii. 597 (1855).

a. Perigynia strongly and often sharply (21) 24–45-nerved.
  b. Perigynia with a short and rather broad apex or point which is turned more or less to one side.
    c. Spikes alternately flowered; scales truncate or retuse, muticous, subflabellate at tip; staminate spike very slender, inconspicuous, equaled or exceeded and often hidden by the aggregated pistillate spikes; culms 1.7–3.5 mm. broad, almost winged, the angles smooth or slightly erose; bracts erect: the broadest 8–20 mm. wide; broadest basal leaves very coarse, 10–40 mm. wide ..... 1. *C. albursina.*
    c. Spikes denser, perigynia much overlapping; scales subtruncate, rounded or acute, usually cuspidate; staminate spike conspicuous or inconspicuous; culms narrower, slightly margined, the angles more or less erosely or retrorsely serrulate-scabrous; leaves and bracts narrower, or sometimes rather broad.
      d. Basal sheaths brown; bracts usually over-topping the culm; staminate spike sessile or short-stalked; rhachis of pistillate spikes sharply angled usually smooth, the scales pale: tip of the perigynium slightly or abruptly bent ..... 2. *C. blanda.*
      d. Basal sheaths purple, but sometimes weathering away; leaves narrower; bracts rarely overtopping the culm; staminate spike usually long-stalked, pistillate spikes more scattered, the scales more often colored; rhachis usually narrower, less sharply angled, granulose; perigynia more cellular, paler, the tip usually more strongly recurved; plants generally more slender ..... 3. *C. laxiflora.*
  b. Perigynia with a narrow and sharp more beak-like straight or only slightly oblique apex.
    c. Basal sheaths purple at least when young.
      d. Angles of the culm plainly granulose; tips of the turgid perigynia usually very short, usually contracted and beak-like, but the perigynia sometimes

appearing blunt and rounded at apex; rhachis smooth: bracts often exceeding the culm.....4. *C. ormostachya.*

d. Angles of the culm smooth or obscurely erose-granulose; perigynia fusiform, very acute, scarcely beaked; rhachis usually granulose, bracts exceeding the culm.....6. *C. ignota.*

c. Basal sheaths brown (angles of the culm smooth, serrulate or obscurely granulose).

d. Spikes contiguous, the staminate more or less obscured; bracts much exceeding the culm, the latter more or less retrorsely scabrous.....5. *C. crebriflora.*

d. Spikes scattered, the staminate prominent; bracts shorter than or scarcely exceeding the apex of the staminate spike; culms with erose, obscurely erose-granulose, or even smooth angles.

e. Perigynia slightly or not at all overlapping, strongly ascending, usually abruptly contracted into a slender beak-like point; bracts generally equalling or projecting beyond the staminate spike; rhachis of the alternate-flowered pistillate spikes smooth; angles of the culm smooth, very rarely slightly erose; leaves soft, on the basal shoots usually broad..... 7. *C. anceps.*

e. Perigynia more overlapping, more spreading, and more gradually acute, also averaging longer; bracts generally ending below the apex of the staminate spike; angles of the culm generally minutely erose-granulose; basal leaves less broad.

f. Pistillate spikes often loosely flowered, the larger on each plant 15–35 mm. long; rhachis smooth, sharply angled; scales abruptly cuspidate; perigynia ascending-spreading; staminate spikes stout, pale, with firm scales; leaves firm, pale.....8. *C. striatula.*

f. Pistillate spikes short and densely flowered, the larger 10–15 mm. long, in the variety 10–20 mm. long; rhachis narrower, not sharply angled; scales acute, not cuspidate; staminate spike narrower, often brown, the scales less firm; leaves narrower, softer, deeper green, and often shorter.

g. Pistillate spikes short and rather dense, the rhachis granulose.

h. Perigynia spreading, curved outward, broadly ellipsoidal.....9. *C. styloflexa.*

h. Perigynia strongly ascending, lance-fusiform, nearly straight.....var. *fusiformis.*

g. Pistillate spikes alternately flowered, the rhachis nearly or quite smooth.....var. *remotiflora.*

a. Perigynia obscurely 15–21-nerved, ellipsoidal, thin and fragile walled, the tip rather slender and straight or slightly oblique, often abrupt; foliage deep green; bracts generally surpassing the staminate spike; culms retrorsely scabrous, rarely almost smooth.....10. *C. leptonervia.*

1. C. ALBURSINA Sheldon, Bull. Torr. Bot. Club. xx. 284 (1893); Mackenzie in Britton & Brown's Ill. Fl. U. S. & Can. *C. laxiflora* ζ

latifolia Boott, Ill. Carex 38. t. 93 (1858). Var. *latifolia* Bailey, Proc. Amer. Acad. xxii. 115 (1886), and in Gray's Man. ed. 6; Robinson & Fernald in Gray's Man. ed. 7. *C. laxiflora* var. *patulifolia*, in part, Dewey in Wood's Class Book.—Plants stout, pale, culms broadly thin-angled, the sides 1.7–3.5 mm. wide, the angles entire or more or less erose; basal sheaths or the outermost dark purple, soon weathering into a dark brown somewhat fibrous mass; broadest basal leaves (10) 18–40 mm. wide; broadest cauline 8–20 mm. wide, these and the broad bracts very erect, the latter much exceeding the culm; sheaths loose, the angles erose-wavy; upper spikes aggregated, the staminate short and very slender, alternately flowered, overtopped and obscured by the pistillate spikes; scales pale or greenish; anthers small 1.4–2.0(2.2) mm. long both when dry and fresh; pistillate spikes alternately flowered, 10–25 mm. long; rhachis broad, smooth; scales truncate or retuse, usually muticous, the tissue at summit more or less fan-shaped; perigynia plainly stipitate, 3.5–4.0 mm. long, rather strongly 27–35-nerved; orifice broad, short, oblique.—Rich upland woods: Vermont, western Massachusetts and western Connecticut to the mountains of Virginia, westward through western Quebec and Ontario, Kentucky and Tennessee to Wisconsin, Iowa, and Missouri.

2. C. BLANDA Dewey, Sill. Jour. x. 45 (1826), also of Britton & Brown's Ill. Fl. ed. 2. *C. anceps*, var. *striatula* Carey in Gray's Man. ed. i. 554 (1848), not *C. striatula* Michx. *C. laxiflora*, var. *striatula* Carey in Gray's Man, ed. 2. 524 (1856); Bailey in Proc. Amer. Acad. xxii. 115 (1886), and Gray's Man. ed. 6. *C. laxiflora* ε *blanda* a. *major* and b. *minor* Boott Ill. Carex 37–38. Pl. 92. fig. 1 & 2 (1858). *C. anceps*, *blanda*, and *striatula* of Dewey in Wood's Class Book various eds. *C. laxiflora*, vars. *blanda* and *varians* of Gray's Man. ed 7.—Plants stout or rather slender, bright green, rarely slightly glaucous; culms 0.8–2.8 mm. in diam., more or less erose-scabrous on the angles; basal sheaths brown; broadest basal leaves 4–12 mm. wide; broadest cauline 2.5–9.0 mm. wide; sheaths rather loose, the angles usually wavy and erose; bracts exceeding the culm; upper pistillate spikes usually contiguous at base of staminate, the latter conspicuous or small and inconspicuous, pale; anthers 2.0–2.8 mm. long when dry, 3.0–3.5 mm. long when fresh; pistillate spikes 5–30 mm. long, the rhachis smooth; scales oblong-ovate, rounded or acute, muticous or cuspidate; perigynia usually crowded, overlapping, spreading-ascending, broadly stipitate, elliptic-obovoid, 24–38 mm. long, olive green when dry, strongly 23–30 nerved, apex acute, broad, slightly bent or abruptly so at tip.—Rich banks and bottomlands about woods in rather dry soil: Vermont and eastern Massachusetts to the District of Columbia, and in the mountains to Alabama, westward through western Quebec and Kentucky to Minnesota, Nebraska, Louisiana, and Texas.

The distinction between *C. laxiflora*, var. *blanda* and var. *varians*, as these two varieties are treated in Gray's Man. ed. 7, appears to be artificial. All conditions of prominence of the staminate spike are found, also all degrees of aggregation of the upper pistillate spikes, without reference to geographical range, and occasionally in the same colony.

3. C. LAXIFLORA Lam. Encyc. iii. 392 (1789). *C. anceps*, var, *angustifolia* Dewey in Wood's Class Book 423 (1845), mainly *C. laxiflora*, var. *angustifolia* Dewey in Wood's Class Book later eds. *C. gracilescens* Steud. Cyp. Plant. 226 (1855). *C. laxiflora* δ *intermedia* (b), in part, Boott, Ill. Carex 37 (1858), not Pl. 91. fig. 1. *C. laxiflora* ε *blanda* (c) *gracillima* Boott, l. c. 38 (1858), and Pl. 91. fig. 2. *C. laxiflora*, var. *intermedia* of Bailey, Proc. Amer. Acad. xxii. 115 (1886). *C. laxiflora*, var. *gracillima* Robinson & Fernald in Gray's Man. ed. 7, 242, inc. fig. 483 (1908). *C. laxiflora* of Bailey, Mem. Torr. Bot. Club. i. 31 (1889), also Gray's Man. ed. 6, and of Mackenzie in Britton & Brown's Ill. Fl. ed. 2, chiefly.—Plants slender, green, yellowish green when dry; culms 0.5–1.2 (1.5) mm. in diam. the angles more or less serrulate-scabrous; basal sheaths purple, often weathering away; broadest basal leaves 3–8 mm. wide; broadest cauline 1.8–5 mm. wide; sheaths close, the angles more or less erose, wavy; bracts rarely exceeding the culms; spikes scattered, the staminate usually peduncled, conspicuous; scales purplish or brownish, rarely pale; anthers 2.0–3.0 mm. long when dry, 3.0–3.5 mm. long when fresh; pistillate spikes usually all scattered, often slender-peduncled, dense or somewhat lax, 7–25 mm. long, the rhachis usually granulose; scales oblong-ovate, acute or truncate, mucronate or short-awned, usually tinged with brown; perigynia usually crowded, divaricate, 2.5–4.1 mm. long, cellular, pale or glaucous-green, strongly 27–35-nerved, short-stipitate; apex tapering but scarcely beaked, usually strongly bent or recurved.—Low ground mostly in alluvial soil: Medford (*Boott*) and Cambridge (*Fernald*), Massachusetts, and from Vermont and Connecticut to the mountains of Virginia, westward through Ontario and Kentucky to Illinois Wisconsin and Mississippi.

This species is very closely related to *C. blanda*, but the purple sheaths, granulose narrow rhachis, more scattered spikes, narrower green leaves, often more curved and paler perigynia, more generally cuspidate and more tawny scales, and shorter bracts usually are sufficient to distinguish it readily though the individual characters fluctuate to a considerable extent. The plant apparently inhabits alluvial ground which is much more moist than that in which *C. blanda* grows. The soil preferred by *C. blanda* seems to be a rich loam,

while that preferred by *C. leptonervia* is generally muck or peat. *C. laxiflora* flowers and fruits somewhat later than other species of this group in central New York.

4. **C. ormostachya** sp. nov. *C. laxiflora* ♂ *intermedia* (b) Boott, Ill. Carex 37 (1858) as to Quebec specimens and possibly Pl. 91. fig. 1. *C. laxiflora*, var. *intermedia*, Bailey, Proc. Amer. Acad. xxii. 115 (1886), in small part. *C. laxiflora* Bailey, Mem. Torr. Bot. Club, i. 31 (1889), in small part; Robinson & Fernald in Gray's Man. ed. 7 242 (1908), in part.—Gracilis viridis statu sicco subluteo-viridis; culmis 0.7–1.4 mm. latis, angulo minute granulosis; vaginis infimis purpureo-tinctis; latissimis foliis infimis 3–8 mm. latis, latissimis caulinis 2.5–5 mm. latis; bracteis culmum superantibus; spicis remotis, masculis plerumque pedunculatis, antheris 2.8–3.2 mm. longis foeminis 12–25 mm. longis alternifloris moniliformibus, rhachi laevi, squamis subacutis mucronatis; perigyniis brevibus turgidis 2.5–3.5 mm. longis, valide 25–35-nervatis, apice perbrevibus tenuibus rectis vel obliquis vix vel perbreviter rostratis.

Plants slender, green, when dry yellowish green; culms 0.7–1.4 mm. in diam., minutely cellular crenulate on the angles; basal sheaths or some of them purple-tinged; leaves narrow, the broadest cauline 2.5–5 mm. wide, the broadest basal 3–8 mm. wide; sheaths close with smooth angles; bracts equaling or exceeding the culm; spikes scattered, the staminate usually peduncled and conspicuous, with purplish or green scales; anthers 2.8–3.2 mm. long when dry; pistillate spikes 12–25 mm. long, alternately flowered, moniliform, the rhachis smooth; scales broad, subacute, mucronate; perigynia usually short and plump, 2.5–3.5 mm. long, strongly 25–35-nerved; apex rounded or abrupt with a very short slender straight or oblique point.—Woods and banks in mostly dry soil: Quebec and Maine to eastern Massachusetts westward through western Massachusetts, the Helderberg Mountains of New York, mountains of Central Pennsylvania, and Ontario, to Lake Superior. Specimens examined: Quebec: Bic, 1905, *F. F. Forbes*; Roberval, 1892, *G. G. Kennedy*; Aylmer, 1899 and 1911, *J Macoun*. Maine: Fort Fairfield, *Fernald*, no. 146; Pleasant Mountain 1875, *W. Boott*; Mt. Kineo, 1888, *E. & C. E. Faxon;* Pembroke, 1909, *Fernald*, no. 1528; Mt. Desert Island, *Faxon, Rand, and Redfield*; Orono, 1897, *Fernald*; South Poland, 1895, *K. Furbish*; North Berwick, 1895, *J. C. Parlin*, 1896, *Fernald & Parlin*; York, 1891, *M. L. Fernald*. New Hampshire: Gorham, 1909, *A. S. Pease*, no. 12210, Franconia, 1896, *E. & C. E. Faxon* (Type, Littleton Hill, in Gray Herb.), also two other collections; Hanover, 1908, *T. W. Edmondson*, no. 4187. Vermont: Willoughby, 1894, *G. G. Kennedy*; Moosalamos Mt., Salisbury, 1897, *E. Brainerd*; Middlebury, 1892, *Brainerd*. Massachusetts: Manchester, 1911, *F. T. Hubbard*, no. 52; Ashfield, 1907, *E. F. Williams*; Sunderland, 1915, *F. G. Floyd*; Chester, 1913, *C. A. Weatherby & R. C. Bean*; Stockbridge, Savoy, Sandisfield, and

North Adams, *R. Hoffmann*. NEW YORK: Alcove, 1892, *C. L. Shear*; DeKalb, 1916, *O. P. Phelps*, nos. 1491 and 1501; Nicholville, 1915, *Phelps*, no. 1479. PENNSYLVANIA: Bells Gap, Blair County 1876 *J. W. Lowrie* (Bailey Herb.) ONTARIO: *J. M. Macoun*, nos. 78474, 84003, and 94084; Kingston, 1906, *A. B. Klugh*, nos. 19 and 31; Belleville, *W. Boott Herb.*; Britannia Highlands, 1911, *J. Macoun*, no. 84005. LAKE SUPERIOR REGION: Eagle Harbor, 1860, *W. Boott Herb.*, Porcupine Mts., 1868, *Henry Gillman in W. Boott Herb.*

This is one of the most distinct of the various segregates of *C. laxiflora*, but is apparently without a name. The moniliform pistillate spikes have suggested the name applied. The species is usually recognized with ease by this character together with the granulose culms and purple basal sheaths.

5. **Carex crebriflora** sp. nov. Subgracilis viridis vel laetoviridis; culmis saepissime retrorse scabris; vaginis infimis bruneis; latissimis foliis infimis 3–5 mm. latis, latissimis caulinis 3–4 mm. latis; vaginis angulo suberosis; bracteis culmum multo superantibus; spicis contiguis; masculis brevibus ab foemineis occultis, antheris 2–2.2 mm. longis, foemineis 5–12 mm. longis confertis, rhachi laevi, squamis ovatis-oblongis peracutis vix cuspidatis; perigyniis 3.8–4.5 mm. longis, 35–42-nervatis fusiformibus, base contractis, apice sensim peracutis vel subobliquis non rostratis.

Plants moderately slender, green or pale green; culms usually retorsely scabrous; basal sheaths brown; broadest basal leaves 3–5 mm. wide; broadest cauline 3–4 mm. wide; sheaths more or less erose on the angles; bracts much exceeding the staminate spike; the spikes contiguous, crowded, the staminate short, obscured by the pistillate; anthers 2.0–2.2 mm. long; pistillate spikes 5–12 mm. long, dense, the rhachis smooth, the scales oblong-ovate or oblong, very acute, scarcely cuspidate; perigynia 3.8–4.5 mm. long, 35–42-nerved, fusiform, narrowed at base, gradually very acute at the straight or slightly oblique often beak-like apex. Bottomlands: South Carolina to Florida and Louisiana. Specimens examined: VIRGINIA: Chick Swamp, Richmond, 1894, *J. R. Churchill* (Herb. Bailey) doubtfully this species; SOUTH CAROLINA: *Dewey Herb.* FLORIDA: Low woods, Appalachicola River bottoms near Chattahoochee, 1882, *A. H. Curtiss* (TYPE, in Gray Herb.), another specimen is *Curtiss*, no. 3267. ALABAMA: rocky ravine on west side of Hurricane Creek near its mouth, Tuscaloosa County, 1911 (*R. M. Harper*, no. 141). MISSISSIPPI: Starkville, 1889, *S. M. Tracey*, nos. 20, 21, and 28 (Herb. Bailey). LOUISIANA: Alexandria, 1841, *J. Hale*, no. 34 (Herb. Bailey).

As shown by the long bracts, aggregated spikes, and often retrorsely scabrous culms, this species is more closely related to *C. blanda* than to the species with acute perigynia. The perigynia how-

ever, are very different from those of *C. blanda*, and the rather narrow very acute but not cuspidate scales are unlike those of any species except *C. styloflexa*.

6. Carex ignota Dewey, Sill. Jour. ser. II. viii. 348 (1849); Sartwell's Exsic, No. 97 (1848). Plant stiff but rather slender, pale green; culms slender, minutely scabrous on the angles above; basal sheaths apparently purple when young but in most cases the color lost through weathering; broadest basal leaves 3–5 mm. wide, stiff, nearly equaling the culms; broadest cauline 2–2.5 mm. wide; sheaths with granulose or erose angles; bracts much shorter than the culm; spikes widely scattered, but lower not on especially long and slender peduncles; staminate spikes generally peduncled, not particularly stout, the scales thin, narrowly oblong; anthers 2.9–3.2 mm. long when dry; pistillate spikes 22–32 mm. long, loosely almost alternately flowered, the rhachis granulose to nearly smooth; scales oblong, acute or subacute, cuspidate; perigynia fusiform, strongly acute at each end, slightly curved, obtusely angled, closely and strongly 28–36-nerved, 4.2–5.0 mm. long. Wooded hillsides; Western Florida to Texas.

This plant is related to *C. striatula* to which it shows a close superficial resemblance. It differs in the more slender spikes, the generally granulose rhachis, and the purple basal sheaths. The granulose nature of the rhachis is clearly evident in only about 80% of the specimens, and the purple sheaths are frequently difficult to make out because of weathering. However, the plants have a different aspect from those of *C. striatula*, which fact together with the characters given, has led to their treatment here as a separate species.

7. C anceps Muhl. in Willd. Sp. Pl. iv. 278 (1805), and Schkuhr's Riedgr, Nacht. 66. t. 128 (1806); Dewey in Wood's Class Book 423 (1845) including var. *patulifolia* Dewey ibid.; Carey in Gray's Man. ed. 1. 554 (1848) including var. *patulifolia;* Mackenzie in Britton & Brown's Ill. Flora ed. 2, including *C. leptonervia* Fernald. *C. plantaginea* Schkuhr, Riedgr. Nacht. 63. t. 195 (1906). *C. laxiflora*, var. *patulifolia* Carey in Gray's Man. ed. 2. 524 (1856); Bailey in Proc. Amer. Acad. xxii. 115 (1886), and Gray's Man. ed. 6; Robinson & Fernald in Gray's Man. ed. 7. *C. laxiflora* γ *plantaginea* and δ *intermedia* (a), in part, of Boott's Ill. Carex 37 (1858).—Plants moderately stout or rather slender, pale or glaucous; culms 0.9–2.0 mm. in diam., smooth or very rarely obscurely erose; basal sheaths brown; broadest basal leaves (5) 7–26 mm. wide; broadest cauline 3.5–8.0 mm. wide; sheaths with smooth or very slightly erose-wavy angles; bracts equaling or exceeding the culm; spikes scattered, the staminate pale, generally conspicuous and peduncled; anthers 2.0–3.0 mm. long when dry, 3.2–4.0 mm. long when fresh; pistillate spikes

15–50 mm. long, alternately flowered, loose, the rhachis smooth; scales oblong-obovate, broadly acute to subtruncate, mucronate or cuspidate, rarely muticous, whitish; perigynia 3.0–4.5 mm. long, broadly fusiform, substipitate; apex short, slender, straight or slightly oblique, usually beak-like, whitish, subhyaline; nerves strong, 24–36.—Rich woods and banks in dry loamy soil: northwestern Nova Scotia and southern Maine to the District of Columbia and in the mountains to North Carolina and Tennessee, westward to Wisconsin and Illinois, also in Oregon.

The broadest basal leaves are often absent at flowering time; hence much of the confusion in the synonomy of the older authors between their *C. laxiflora* and vars. *plantaginea*, *patulifolia*, and *intermedia*. The perigynia vary considerably in size and number of nerves, but the variations are gradual and varieties cannot be satisfactorily established.

8. C. STRIATULA Michx. Fl. Bor. Am. ii. 173 (1803). *C. laxiflora* Boott's Ill. Carex 36. Pl. 89 (1858). *C. laxiflora*, var. *divaricata* Bailey, Mem. Torr. Bot. Club i. 33 (1889) and Gray's Man. ed. 6. *C. laxiflora*, var. *Michauxii* Bailey, Mem. Torr. Club l. c. as to the Michaux synonym at least.—Plants rather stiff and coarse, pale or glaucous; culms 0.8–1.8 mm. in diam., minutely granular-scabrous on the angles at least above; basal sheaths brown; broadest basal leaves 7–15 mm. wide; broadest cauline 2–7 mm. wide, all rather stiff; angles of the cauline sheaths smooth or slightly scabrous; bracts usually shorter than the culms; spikes scattered, the staminate pale, conspicuous, usually stout and clavate, usually peduncled; scales firm; anthers 3.2–4.3 mm. long; pistillate spikes (larger 15–35 mm. long) rather loosely and somewhat alternately flowered; rhachis, smooth; scales oblong, acute, cuspidate; perigynia 3.8–5.0 mm. long, broadly ellipsoidal, short-stipitate, more or less curved outward; apex evenly and gradually acute, firm; nerves 30–45.—Upland banks and woods: eastern Massachusetts to Alabama.

The leaves differ in color and texture from those of *C. anceps*, and the perigynia contrast more in color with the scales, also they average larger. In distance between the flowers of the pistillate spikes this species lies between *C. anceps* and *C. styloflexa*. Two specimens have been examined which extend the previous known range from New Jersey to eastern Massachusetts. These are: Trumbull, Connecticut, 1903, *E. H. Eames*, no. 3934 (Herb. New Eng. Bot. Club), and Morse's Pond, Wellesley, Massachusetts, 1910, *K. M. Wiegand* (in Herb. Wellesley College and New York State College of Agriculture).

9. C. STYLOFLEXA Buckley, Amer. Jour. Sci. ser. II. xlv. 174 (1843); Mackenzie in Britton & Brown's Ill. Flora ed. 2. *C. laxiflora* β *styloflexa* Boott, Ill. Carex 37. Pl. 90 (1858); Robinson & Fernald in Gray's Man. ed. 7.—Plants tall and slender for the group, brighter green, yellowish green when dry; culms 0.5–1.4 mm. in diam., more or less granulose-scabrous on the angles; basal sheaths brown; broadest basal leaves 2.5–8 mm. wide; broadest cauline 1.8–4 mm. wide, mostly soft; sheaths rather close, the angles smooth or slightly scabrous; bracts usually shorter than the culms; spikes widely scattered, the staminate usually conspicuous and peduncled, the scales, thin, often brown; anthers 3.0–4.0 mm. long; pistillate spikes rather dense, the larger 10–15 (18) mm. long, the rhachis granular-roughened; scales narrowly oblong, acute, rarely cuspidate; perigynia (35) 40–45 mm. long, broadly ellipsoidal, stipitate, divaricate and curved outward, slender-tipped, (21) 24–33-nerved.—Low meadows and woodlands: Connecticut to Florida, Kentucky, Louisiana, and Texas.

Var. **fusiformis** (Chapman) comb. nov. *C. fusiformis* Chapman in Dewey, Sill. Jour. Ser. II. vi. 244 (1848). *C. Chapmanii* Steud. Cyp. Plant. 222 (1856).—Perigynia fusiform-lanceolate, straighter and more ascending; scales lance-oblong.—Damp soil on hammocks: Florida.

The specimens of this variety show some indication of being stoloniferous, and the perigynia are rather characteristic. The plant may prove to be a distinct species.

Var. **remotiflora** var. nov. Foliis perbrevibus et perangustis; spicis laxiflorioribus et longioribus, perigyniis adscendentioribus; rhachibus sublaevibus. Leaves very short and narrow; spikes more loosely flowered and longer; perigynia more ascending; rhachis of the spikes almost or quite smooth. Alabama and northern Florida. Cullman, Alabama, 1891, *Charles Mohr*, no. 8 (Herb. Bailey). Chattahoochee, Florida *A. H. Curtiss* (TYPE in Herb. Bailey).

Mackenzie (Ill. Flora ed. 2) states that the basal sheaths of *C. styloflexa* are sometimes purple, but purple color is not evident in any of the specimens studied by the writer.

10. C. LEPTONERVIA Fernald, RHODORA xvi. 214 (1914). *C. laxiflora*, var. *varians* Bailey, Mem. Torr. Bot. Club i. 32, 1889, and Gray's Man. ed. 6. *C. laxiflora* var. *leptonervia* Fernald, RHODORA viii. 184 (1906), and Gray's Man. ed. 7. *C. anceps* Dewey in Wood's Class Book and Dewey Herb. in large part, not Muhl.; Britton & Brown's Ill. Flora ed. 2 in part. *C. laxiflora* δ *intermedia* Boott, Ill. Carex 37 (1858), in part, especially as to (a).—Plants very slender, bright green; culms 0.4–1.5 (1.8), mostly 0.5–1.1 mm. in diam., retrorsely scabrous, rarely nearly smooth; outer basal sheaths dark purplish brown soon weathering away; basal leaves often large, the broadest (3) 5–10 mm. wide; cauline narrow and rather short the

broadest 2.5–6 (7) mm. wide; sheaths with erose-scabrous angles; bracts usually exceeding the culm; upper spikes often aggregated; staminate spike not large, often partially hidden by the pistillate, the latter 10–30 mm. long, alternately to rather densely flowered; the rhachis smooth; scales often tinged with color, subtruncate to acute, usually mucronate, rarely muticous or even retuse; perigynia ellipsoidal, 2.5–4.0, mostly 3.0–3.7 mm. long, slenderly substipitate thin and fragile walled, apex acute, often slightly beak-like, straight or slightly oblique, nerves obscure, 15–21; anthers 1.3–2.3 mm. long when dry, 1.7–2.5 mm. long when fresh.—Low woods in mucky or peaty soil, rarely in drier places: Labrador to Connecticut and in the mountains to North Carolina and Tennessee, westward through Ontario and New York to Minnesota and probably to Manitoba.

This species was not recognized by Dewey and Boott, and probably was treated by each of these authors under more than one name. The type of Bailey's *C. laxiflora* var. *varians* must be considered to be that one to which he referred in his original description, namely, the specimen on which his cited synonym, "*C. laxiflora* var. *intermedia* Bailey, Bull. 3. Minn. Nat. Hist. & Geol. Surv. 22, 1887, not Boott" was based. This specimen now in the Bailey herbarium is *C. leptonervia*. Of the specimens in the Bailey herbarium at the time the treatment in Gray's Man. ed. 6 was written, and labelled *C. laxiflora* var. *varians*, five are *C. leptonervia*, one is *C. ormostachya* and two are *C. blanda*. There is therefore no doubt that *C. laxiflora* var. *varians* should be considered synonymous with *C. leptonervia*. The writer cannot follow Mackenzie in reducing *C. leptonervia* to *C. anceps*, as it appears to have no close affinity with that plant, and to be as distinct as any of the species here treated. Besides the difference given in the key the leaves, when fresh, are greener and more plicate than in *C. anceps* and more like those of *C. laxiflora* and *C. blanda*. In central New York *C. leptonervia* commonly inhabits the peaty or mucky soils on the borders of swamps.

Cornell University, Ithaca, New York.

NOTES ON THE FLORA OF WESTERN NOVA SCOTIA 1921.

M. L. Fernald.

(*Continued from page 181.*)

Cuscuta Gronovii Willd. *C. vulgyvaga* Engelm. Am. Journ. Sci. xliii. 338 (1842). *C. Gronovii* α *vulgivaga* Engelm. Trans. Acad. Sci. St. Louis i. 508 (1859); Yuncker. Revis. N. A. and W. I. Cuscuta,

65 (1921). Lunenburg Co.: wet thickets and swales back of brackish shore of Lahave River, Bridgewater; upper border of cobbly beach, Wentzell Lake.

Var. *vulgivaga* is the typical form of the species as was clearly indicated by Engelmann in publishing it: "It is Willdenow's original *C. Gronovii*, in his Hb. nro. 3160."

**C. Gronovii, var. latiflora Engelm. Trans. Acad. Sci. St. Louis, i. 508 (1859); Yuncker, l. c. (1921). *C. Saururi* Engelm. Am. Journ. Sci. xliii. 339 (1842). Yarmouth Co.: thickets and damp shores, Quinan, Argyle and Belleville. A coastal plain variety recorded by Yuncker as extending from Texas to southern Illinois and New Jersey.

All our material of var. *latiflora* from Nova Scotia has large, depressed-globose or oblate capsules, in maturity 4–5 mm. broad, and unusually large seeds, 2.2–3 mm. long. Its corolla and anthers are exactly those of the southern plant and, although Yuncker in his recently published *Revision of the North American and West Indian Species of Cuscuta* excludes *C. Gronovii* (in his key, p. 47) from the group characterized by "Capsule globose, more or less depressed," and places it (p. 48) in the group with "Capsule globose-ovoid to conic or long-beaked," many of the specimens placed by him under this species have definitely depressed-globose capsules like the plant of western Nova Scotia. Similarly, although Yuncker's description of *C. Gronovii* calls for seeds "about 1.5 mm. long," many plants which he has identified have seeds up to 2.3 mm. long. The old corollas of *C. Gronovii* and var. *latiflora* sometimes crown the capsule. In such cases there is great difficulty in distinguishing the plants with depressed-globose capsules from *C. Cephalanthi* Engelm. In the latter species, however, the anthers are smaller and more rounded than in *C. Gronovii*.

Mertensia maritima (L.) S. F. Gray, forma albiflora Fernald, Rhodora, xxiii. 288 (1922). Rocky barrier beach, Markland (Cape Forchu), and very abundant and uniform on the barrier beach at East Jordan.

Teucrium canadense L., var. littorale (Bicknell) Fernald. Shelburne Co.: crest of barrier beach, East Jordan.

**Solanum Dulcamara* L., var. *villosissimum* Desv. Pl. Angers, 112 (1818). β. *tomentosum* Koch, Syn. 507 (1838). γ. *marinum* Bab. Man. 210 (1843). *S. littorale* Raab in Flora, ii. 414 (1819).—Much of the material collected in western Nova Scotia, at various stations especially near the coast of Yarmouth, Shelburne and Annapolis Cos., belongs to the variety with velvety or densely pilose foliage.

We have it from various stations in Newfoundland, Quebec, and Massachusetts.

Gratiola aurea Pursh. Common eastward to Annapolis and Lunenburg Cos.

Veronica agrestis L. Waste ground, Dartmouth.

Agalinis neoscotica (Greene) Fernald, Rhodora, xxiii. 139 (1921). Many additional stations including some in Shelburne Co.

**A. maritima Raf. *Gerardia maritima* Raf. Yarmouth Co.: very abundant on the salt marsh along Argyle River, Argyle Head. Heretofore unknown east of York Co., Maine.

Utricularia geminiscapa Benj. Additional stations in Shelburne, Lunenburg and Halifax Cos.

U. minor L. Additional stations in Digby Co.

U. gibba L. Additional stations, in Yarmouth Co.: forming a filmy turf in quagmire-margin of Sloane Lake, Carleton. Lunenburg Co.: forming compact mats in shallow pools at outlet of Hebb's Lake, Bridgewater; peaty quagmire-margin of Frank Lake and of a near-by small pond, Upper Cornwall.

U. purpurea Walt. Frequent or common eastward to Hants Co.

U. cornuta Michx. A colony in exposed peat and sand by Rhodeniser Lake, Lunenburg Co., is noteworthy on account of its forking stems—with 2 or 3 long branches.

**Conopholis americana (L. f.) Wallr. Lunenburg Co.: dry pine and oak woods on steep slopes along Lahave River, Bridgewater; locally abundant, many stems springing from deep-seated thick bases attached to oak-roots. Freshly bruised plant with a strong odor of cider.

Littorella americana Fernald. On the shores of Shubenacadie Grand Lake *Littorella* did not flower in 1920, owing to the high water; but in 1921 it formed freely flowering carpets stranded on the sandy and shingly beach.

Plantago lanceolata L. There are two well defined varieties of *Plantago lanceolata* naturalized in America and a second species which has been confused with them. The varieties are distinguished as follows.

Spike at beginning of anthesis narrowly ovoid-conic, tapering to apex; in fruit cylindric and obtuse, 1.5–8 cm. long: leaf-blades 0.5–2.3 dm. long, 0.6–4 cm. broad: scapes up to 8 dm. tall ..... *P. lanceolata* (typical).

Spike at beginning of anthesis subglobose, rounded to apex; in fruit subglobose to cylindric and obtuse, 0.5–2.3 cm. long: leaf-blades 0.2–1.2 dm. long, 0.3–2 cm. broad: scapes 0.3–4.5 dm. tall.

Upper leaf-surfaces green, glabrous or sparsely pubescent. Var. *sphaerostachya.*

Upper leaf-surfaces gray with abundant long hairs. Var. *sphaerostachya,* forma *eriophora.*

P. lanceolata L. (typical). Generally naturalized from Newfoundland to British Colombia and southward. A locally abundant variant

has the spike branching sometimes with a few, more often with many short and densely crowded branches.

**Var. *sphaerostachya* Mert. & Koch in Roehling, Deutschl. Fl. i. 803 (1823). γ. *pumila* Koch, Syn. 597 (1837). β. *capitellata* Schultz, Fl. Pfalz, 380 (1846). δ. *capitata* Dene. in A. DC. Prodr. xiii. pt. 1: 715 (1852). *P. microcephala* Royle acc. to Barneoud, Mon. Plant. 29 (1845), not Poir. *P. sphaerostachya* (Mert. & Koch) Kern. Schedae ad Fl. exsicc. Austro-Hung. iv. 71 (1886), not Hegetschw. Fl. Schweiz, 116 (1840).—Fields and roadsides, Newfoundland; Nova Scotia; southern New England; California to British Columbia.

**Var. *sphaerostachya*, forma *eriophora* (Hoffmansegg & Link) Beck von Man. Fl. Nied.-Oesterr. ii. 1093 (1893). *P. eriophora* Hoffmansegg & Link, Fl. Port. i. 423 (1809). *P. hungarica* Waldst. & Kit. Pl. Rar. Hung. iii. 225, t. 203 (1812). *P. lanata* Host. Fl. Austr. i. 210 (1827). *P. lanceolata* δ. *lanuginosa* Koch, Syn. 597 (1837).—Nova Scotia; southern New England; Oregon.

A closely related species, *P. altissima* L. Sp. ed. 2, i. 164 (1762); Kern, Ost. Bot. Zeit. xxv. 59 (1875); Beck von Man. Fl. Nied.-Oesterr. ii. 1093 (1893), was collected by the late H. S. Clark somewhere on the "Connecticut coast" in 1899. The label gives no further information but is sufficient indication that the plant is to be watched for. *P. altissima* is a stouter plant than *P. lanceolata*, with heavy, creeping root, large leaves (up to 4 dm. long and 4 cm. broad) glabrous upon both surfaces; stout scapes 0.6–1. m high; and flowers 6–7 mm. broad (in *P. lanceolata* mostly under 5 mm.).

*Cephalanthus occidentalis L. Shelburne Co.: rocky shore of Deception Lake; among granite boulders by Lake John; at both stations scarce and local. Mr. R. H. Wetmore informs me that he has found *Cephalanthus* on Cameron Lake (head of Medway River), Queens Co.

Viburnum alnifolium Marsh. Rare in Yarmouth Co.: thickets and mixed woods near Lake George. Becoming frequent in Digby Co. Thence eastward through the northern and central region at least to Halifax Co.

Solidago latifolia L. Lunenburg Co.: shaded ledges by Lahave River above Bridgewater.

Solidago bicolor L. Shelburne Co.: from Shelburne eastward,

*S. uniligulata (DC.) Porter, var. neglecta (T. & G.) Fernald, Rhodora, xxiii. 292 (1922). The plants in a spruce swamp at Markland (Cape Forchu), Yarmouth Co., are thoroughly characteristic of the variety which, in extreme development, we have not had from east of southern Maine.

S. Elliottii × rugosa. One colony, apparently of this origin, on a gravelly bank south of Belleville, Yarmouth Co.

S. CANADENSIS × UNILIGULATA. One clump, apparently of this origin, in a thicket near Five-River (Morris), Lake Shelburne Co.

S. SEROTINA Ait., var. GIGANTEA (Ait.) Gray. Various stations from Yarmouth Co. to Lunenburg Co.

SOLIDAGO TENUIFOLIA Pursh. Many additional stations from Yarmouth and Digby Cos. to Halifax Co.

*ASTER UNDULATUS L. LUNENBURG Co.: frequent in dry thickets and borders of woods about Bridgewater and northward at least to Wentzell Lake.

*ASTER LINDLEYANUS T. & G. HANTS Co.: border of old hillside woods, Mt. Uniacke.

*ANTENNARIA PARLINII Fernald. LUNENBURG Co.: abundant at the border of dry pine and oak woods on steep slopes along Lahave River, Bridgewater.

ANAPHALIS MARGARITACEA (L.) B. & H., forma **anochlora, n. f., foliis lineari-lanceolatis supra viridibus glabris sub inflorescentia valde reductis.

Leaves linear-lanceolate, green and glabrous above, much reduced below the inflorescence.—Occasional throughout the range of the typical form. TYPE: dry clearings and burns near Five-River (Morris) Lake, Shelburne Co., Nova Scotia, September 10, 1921, *Fernald & Long*, no. 24,670, in Gray Herb.

Forma *anochlora*, on account of its bright green upper leaf-surfaces, is often sent out as var. *occidentalis* Greene. That variety, of more boreal range than the slender-leaved *A. margaritacea* and forma *anochlora*, has the leaves of more oblong tendency and scarcely reduced in size below the inflorescence. For discussion of it see RHODORA, xiii. 25-37 (1911).

Ambrosia trifida L. Waste ground, Dartmouth.

RUDBECKIA LACINIATA L., var. **gaspereauensis, n. var., foliis subtus et petiolis et rhachibus pilosis.

Lower surfaces of leaves, petioles and rhachises pilose.—NOVA SCOTIA: alluvial soil in thickets close to shore or on the strand of streams and brooks of the Gaspereau River system, Kings County. The type material collected at the border of an alder thicket by Black River (tributary to the Gaspereau), August 31, 1921, by Prof. *H. G. Perry* (TYPE in Gray Herb.).

This indigenous and isolated Nova Scotian variety differs from the continental plant in the development of long pubescence, typical *R. laciniata* being glabrous or merely scabrous.

COREOPSIS ROSEA Nutt. Additional stations, all in YARMOUTH Co.: Salmon (Greenville) Lake; Goven, St. John (Wilson) and Gilfilling Lakes.

Bidens cernua in eastern America. *Bidens cernua* L. is a highly variable species with several well defined varieties in northeastern America. It belongs to a group of three species with simple leaves and achenes with a convex cartilaginous summit. These three species may be distinguished as follows.

Mature disk (except in depauperate extremes) 1.3–2.8 cm. broad: fruiting heads often nodding: outer involucre reflexed, spreading or merely subascending: disk-corollas 4–5 mm. long, 5-toothed: anthers exserted, purple-black: achenes not conspicuously striate between the margins and midribs or keels; the central 1.8–2.5 mm. broad.

Achenes straight and flat, not winged nor strongly keeled, deep-brown or purplish; the outer 6–8 mm. long, with marginal awns 2.8–4.5 mm. long; the central 8–9.5 mm. long, with marginal awns 3.5–5 mm. long: stem firm and usually smooth; its rooting base up to 6 dm. long: outer involucre rarely longer than the inner: chaff reddish-tipped: rays 1.5–3 cm. long ..... *B. laevis.*

Achenes curved, with almost wing-like pale margins and keels, olivaceous; the outer 3.3–6.3 mm. long, with marginal awns 2–2.8 mm. long; the central 4.2–7.8 mm. long, with marginal awns 2.6–4 mm. long: stem soft and usually somewhat hispid; its rooting base rarely 1 dm. long: outer involucre mostly longer than the inner: chaff yellow-tipped: rays wanting or at most 1.7 cm. long ..... *B. cernua.*

Mature disk rarely 1.5 cm. broad: fruiting heads erect: outer involucre ascending: disk-corollas 3.5–4 mm. long, 4-toothed: anthers included, pale: achenes distinctly 7–15-striate on each face; the central 1.4–1.9 mm. broad, flat, olive-brown or drab ..... *B. hyperborea.*

Bidens laevis is not specially variable with us; the variations of *B. hyperborea* have recently been discussed;[1] and to round out the treatment of this group the northeastern varieties of *B. cernua* are here considered. Our variations of this species are as follows.

Stems stoutish, 0.25–1 cm. in diameter at base, commonly branching, 0.5–1.8 m. high: leaves sessile or at most narrowed at base, thickish, 0.2–2 dm. long; heads commonly numerous, broadly hemispherical, many-flowered; the primary ones with disks 1–2.7 cm. broad, nodding in fruit: outer involucre of 5–10 bracts; inner of about 8 bracts 6–12 mm. long.

Leaves tapering to long acuminate-attenuate tips; the primary with 4–24 pairs of sharp serrations: bracts of outer involucre linear to lanceolate, acute or acutish.

Leaves with broad connate or subconnate bases, scarcely narrowed below the middle.

Leaves linear to oblanceolate, with 4–13 pairs of coarse teeth 1–5 mm. high ..... *B. cernua* (typical).

[1] Rhodora, xx. 146–150 (1918).

Leaves linear- to lance-oblong, with 12-24 pairs of fine teeth scarcely 1 mm. high ..... Var. *integra*.
Leaves conspicuously narrowed at base, elliptic-lanceolate ..... Var. *elliptica*.
Leaves mostly blunt or round-tipped; the primary ones entire or with 1–6 pairs of remote teeth: bracts of outer involucre oblong to spatulate, with obtuse or rounded tips ..... Var. *oligodonta*.
Stem capillary, simple or only slightly forking, 0.2–2 dm. high: leaves petioled, oblanceolate or spatulate, thin, 0.4–2.5 (rarely –4) cm. long: heads solitary or very few, campanulate, few-flowered, with disks 1.5–10 mm. broad, scarcely nodding in fruit: outer involucre of 2–6 bracts; inner involucre of 3–6 bracts 2–7 mm. long ..... Var. *minima*.

B. CERNUA (typical). Sloughs, springs, pools and wet shores, extending northeastward to Chicoutimi, Rimouski and Bonaventure Cos., QUEBEC, MADGALEN ISLANDS and Cape Breton, NOVA SCOTIA; Eurasia.

In Nova Scotia unknown from west of Annapolis and Lunenburg Cos.

**Var. INTEGRA Wiegand, Bull. Torr. Bot. Cl. xxvi. 418 (1899).—PRINCE EDWARD ISLAND; Cape Cod, MASSACHUSETTS; Illinois to western North Carolina, Oklahoma and South Dakota.

Var. ELLIPTICA Wiegand l. c. 417 (1899). *B. elliptica* (Wiegand) Gleason, Ohio Nat. v. 317 (1905).—Extending northeastward to the Ottawa Valley, ONTARIO and QUEBEC, and PRINCE EDWARD ISLAND.

Var. OLIGODONTA Fernald & St. John, RHODORA, xvii. 25 (1915).—Brackish or saline shores, MAGDALEN ISLANDS, PRINCE EDWARD ISLAND and MASSACHUSETTS locally inland to western NEW YORK.

**Var. MINIMA (Huds.) DC. Prodr. v. 595 (1836). *B. minima* Huds. Fl. Angl. 310 (1762).—Bogs and shallow pools, MAGDALEN ISLANDS to southern NEW HAMPSHIRE and western NEW YORK and northwestward; Europe.

Our only Nova Scotian collection is from LUNENBURG Co.: boggy margins of shallow pools, outlet of Hebb's Lake, Bridgewater.

*B. CONNATA Muhl.; Fernald, RHODORA, x. 200 (1908). LUNENBURG Co.: wet thickets and swales back of brackish shore of Lahave River, Bridgewater; first station east of southern Maine. Earlier records belong to var. *petiolata* (Nutt.) Farwell.

B. FRONDOSA L., var. ANOMALA Porter. YARMOUTH Co.: in *Zostera* litter, gravelly sea-beach, Yarmouth Bar; margin of thicket bordering cobbly beach of Parr Lake; the latter station unusual in being on a fresh-water lake, the variety usually occurring in brackish habitats.

*MEGALODONTA BECKII (Torr.) Greene. *Bidens Beckii* Torr. DIGBY Co.: deadwater of Rocky Brook north of Hasset; first station east of the Penobscot.

Chrysanthemum Leucanthemum L. The typical form of the species is apparently common at Annapolis Royal and Granville, and pre-

sumably in Annapolis Co.; the common plant generally throughout the province being var. PINNATIFIDA Lecoq. & Lamotte.

**Artemisia Pontica* L. Waste ground, Dartmouth.

PETASITES PALMATUS (Ait.) Gray. Very rare in the western counties. Seen by us only at one station in YARMOUTH Co.: sphagnous thicket, Belleville.

SENECIO AUREUS L. Very rare in the western counties; seen by us only at one station in YARMOUTH Co.: sphangous thicket, Belleville.

LACTUCA HIRSUTA Muhl. Widely dispersed but nowhere abundant in Yarmouth and Shelburne Cos.

PRENANTHES NANA (Bigel.) Torr. YARMOUTH Co.: turfy crests and slopes of exposed headlands, Markland (Cape Forchu).

HIERACIUM PANICULATUM L. Occasional from Yarmouth Co. eastward at least to Annapolis and Lunenburg Cos.

H. **paniculatum × **scabrum**. A large colony exactly combining the characters of *H. paniculatum* and *H. scabrum* and more abundant than either of them, in dry pine and oak woods on steep slopes along Lahave River, Bridgewater, Lunenburg Co.

MUSCARI COMOSUM IN OREGON.

J. C. NELSON.

BY a rather startling coincidence, the discovery of *Muscari comosum* (L.) Mill. in the East, as reported by Mr. Long in RHODORA **24**: 17 ff. (1922), was simultaneous with its first appearance on the other side of the continent. Here also it was first brought to notice by a school pupil. The first specimens were brought to the botany class of the Salem High School in the first week of May, 1921, by Carter Keene, a farmer's son living about sixteen miles north of Salem. A hasty consultation of that invaluable manual, Gray's Field, Forest and Garden Botany led us to name it tentatively *Muscari comosum*—a determination afterwards kindly confirmed by Mr. Long, who was about the same time studying the material collected by him at Philadelphia The "find" was so unexpected that a personal visit to confirm the details seemed in order, and I accordingly accompanied young Keene to his home one Friday afternoon after school. The station in which the plant was growing was about 2½ miles north of Waconda, Marion County, in the northwest corner of a field of some 90 acres belonging to the elder Keene. This field had been sown to oats the previous season; in the fall the stubble had been plowed under and the ground left fallow for the following year.

About forty plants were counted, scattered among the furrows over an area of perhaps one hundred yards square. The farm-house was about 300 yards south, on the opposite side of the highway. No other dwelling appeared in the immediate vicinity, though a house had once stood on the same side of the road, about a hundred yards beyond the Keene homestead, the site being marked by an old cellar and a solitary specimen of *Salix babylonica*. Along the roadside near this tree was another interesting plant that sometimes appears mysteriously in western Oregon—*Reseda alba* L. None of the Keene family could offer any explanation for the presence of the Muscari, as they had moved to the farm only a year before. It had of course attracted their attention, and the father persisted in calling it "death camas," although the resemblance to *Zygadenus venenosus* was by no means marked.

Although the plant appeared fairly well established, there seemed reason to fear that its location in a cultivated field might make its tenure decidedly precarious. It was therefore without any strong expectation of finding it again that I made a second visit to the spot on May 27 of the present year (1922). The field had been again sown to oats, which were already breast-high; but scattered everywhere among the grain over the original area were the brilliant violet-tipped clusters of the Muscari. No other weed except the omnipresent grain-field pest of the Northwest, *Centaurea Cyanus*, seemed as well established. An attempt to dig out some specimens showed that the plant had been clever enough to send its bulbs down far enough to escape the plow, and that the problem of survival had therefore been met and solved. The bulbs that had not been more than six inches below the surface at the time of the first visit, had gone down to at least 30 inches in the cultivated ground. We found that the Keene family had transplanted some of the bulbs, and we brought home a few others for our own gardens.

It is even more difficult to explain the plant here than at the Philadelphia station. Almost anything may be expected to appear in the miscellaneous refuse that collects about a large city; but how such a plant found its way into a remote rural neighborhood is hard to understand. If the seeds were introduced in seed-oats, why has it not appeared elsewhere? It has never been reported in cultivation in this part of Oregon—even *M. botryoides* is much less common here than in the East, and has never been found growing spontaneously.

The Oregon specimens agree perfectly with the excellent description given by Mr. Long. It is interesting to note that Linnaeus originally placed this and the other species of *Muscari* in *Hyacinthus*; and it remained for Philip Miller to point out that the shape of the corolla in this group showed so marked a deviation from the funnel- or bell-shaped corolla of *Hyacinthus* proper as to justify a generic segregation.

Boissier in the Flora Orientalis **5**: 291 (1884), gives the native range of *M. comosum* as from Greece and Thrace to Transcaucasia, Asia Minor, Cyprus and Mesopotamia, westward over all of central and southern Europe to Belgium, and into northern Africa. All these Mediterranean weeds seem to find the climate and soil of Oregon peculiarly congenial, and each season marks the appearance of immigrants previously unknown.

Salem, Oregon.

THE AMERICAN VARIATIONS OF LINNAEA BOREALIS.

M. L. Fernald.

For many years the Twinflower of northeastern America passed unquestioned as identical with the European *Linnaea borealis* L., and after it was separated in 1825 as *L. americana* Forbes, it was not generally treated as even varietally distinguishable from the European until it was revived as a species by Britton[1] in 1901 and as var. *americana* (Forbes) Rehder, Rhodora, vi. 56 (1904). In all recent treatments which I have examined it seems to be implied that the typical *L. borealis* does not occur in America and that our plants all belong to the broadly distributed var. *americana* and the more restricted var. *longiflora* Torr. of the Pacific slope, or to a reputed Alaskan species, *L. serpyllifolia* Rydberg, Journ. N. Y. Bot. Gard. viii. 135 (1907). Much of the material from western Alaska and the Aleutian Islands, however, the plant called by Rydberg *L. serpyllifolia*, is quite like typical European *L. borealis*. The western var. *longiflora*, similarly, does not seem to be clearly interpreted. Sometimes, as by Rydberg,[2] it has been treated as a species; sometimes, as by Piper,[3] it has been united without attempt at differentiation with the widely dispersed

[1] Britton, Man. 873 (1901).
[2] Rydb. Fl. Rocky Mts. 812 (1917).
[3] Piper, Fl. Wash. 528 (1906).

var. *americana* as a species, *L. americana;* while later, by Piper & Beattie,[1] all material of the northwest coast has been treated without distinction as var. *longiflora.* Again, certain plants from the lower St. Lawrence, on account of unusually long corollas (1.5 cm.) have been distributed as var. *longiflora.* In view of this diversity of interpretation the following statement of the essential characters of the three well defined American varieties may be of service.

Corolla campanulate, 6–9 mm. long, flaring from well within the calyx, the tube very short: calyx-segments 1.5–2.7 mm. long. ..... *L. borealis* (typical).
Corolla more funnelform, flaring from above the calyx, its tube exserted.
Calyx-segments 1.5–3 mm. long: corolla 8–15 mm. long... Var. *americana.*
Calyx-segments 3–5 mm. long: corolla 10–16 mm. long....Var. *longiflora.*

L. BOREALIS L. Sp. Pl. 631 (1753). *L. serpyllifolia* Rydb. Journ. N. Y. Bot. Gard. viii. 135 (1907).—Northern Eurasia; Alaska. The following Alaskan specimens are characteristic: Cape Nome, 1900, *Blaisdell;* Anvik, July 20, 1907, *J. W. Chapman*; lower Yukon, 1910, *J. A. Kusche*; Makushin Bay, Unalaska, July 14, 1907, *E. C. Van Dyke,* no. 39; Nazan Bay. Atka Island, July 28, 1907, *Van Dyke,* DO. 278.

In describing *L. serpyllifolia,* Rydberg stated that the Alaskan plant differs from *L. borealis* "in the very narrow [linear-subulate] almost glabrous calyx-lobes . . . smaller size [corolla about 6 mm. long] of the flower and of the leaves [5–8 mm. long], and in the indistinct toothing of the latter." But surely much of the European plant has linear-subulate calyx-segments. Witness the detailed illustrations in Wittrock's exhaustive study[2] of variation in the European plant—for instance t. 6, figs. 9a and 25a, t. 7, fig. 11a, t. 8, figs. 10a and 29a, t. 9, fig. 13a, etc. etc. Similarly Wittrock recognizes in Europe six named forms with the corolla between 6 and 7 mm. long, and he defines the smaller-leaved forms of Europe with leaves as small as in the Alaskan plant, while such an illustration as his t. 6, fig. 7, showing strictly entire leaves is convincing proof that the Alaskan plant is not specifically separated by the "indistinct toothing" of the leaves. Rydberg recognizes his *L. serpyllifolia* as apparently occuring "also . . . on the island of Sachalin." It is elsewhere in eastern Asia (Amur, *Maximowicz*; Kamtchatka, *Kusmischscheff*; Transbaicalia, *Turczaninow;* Irkutsk, *Haupt*; etc.) and it

[1] Piper & Beattie, Fl. N. W. Coast, 338 (1915).
[2] Wittrock, Linnaea borealis L. Species polymorpha et polychroma. Acta Horti Bergiani, iv. no. 7 (1907).

extends thence westward and is quite inseparable from typical *L. borealis* of Europe.

Var. AMERICANA (Forbes) Rehder, RHODORA, vi. 56 (1904) *L. americana* Forbes, Hort. Woburn. 135 (1825). Var. *longiflora*, forma *insularis* Wittrock, Acta Horti Bergiani, iv. no. 7: 173, t. 13, fig. 11 (1907). Var. *longiflora*, forma *orientalis* Wittr. l. c. figs. 7–9, (1907). *L. borealis*, forma *curticalyx* Wittr. l. c. 174 (1907). *L. borealis* forma *minutifolia* Wittr. l. c. t. 13. fig. 14 (1907). *L. borealis*, forma *integerrima* Wittr. l. c. t. 13 fig. 15 (1907).—Western Greenland and Labrador to Alaska, south to southern New England, Long Island, Maryland, West Virginia, Indiana, South Dakota, Colorado, Utah and northern California.

Var. LONGIFLORA Torr. in Wilkes, S. Pacif. Expl. Exped. xvii. 327 (1874). *L. longiflora* (Torr.) Howell, Fl. N. W. Am. 280 (1900). Var. *longiflora*, forma *angustissima* Wittrock, l. c. 173, t. 13, fig. 12 (1907).— Southwestern British Columbia to northern California. —GRAY HERBARIUM.

The date of the September issue (unpublished as this goes to press) will be announced later.